Page 11, line 9, after "SNR$_{post}$", insert --from the current iteration--;
          after "SNR$_{est}$", insert --from the immediately preceding iteration--; and
          change "for the next iteration" to --to attain SNR$_{prior}$--.

Page 11, line 15, delete "of" (second occurrence).

Page 16, line 23, change "value is used" to --update is carried out"--.

Page 17, line 1, delete "estimated noise energy";
          delete "corresponding";
          after "is" (second occurrence), insert "preferably"; and
          change "and," to --to update the noise energy.--

Page 17, line 2, change "instead, the" to --The--.

Page 17, line 3, change "any subsequent" to --using the wrong frame type--.

Page 17, line 4, cancel the entire line.

Page 17, line 5, delete "failures to converge".

Page 19, line 14, after "noise', insert --, known as E$_n$', using a new set of filter gains G'(f)--.

IN THE CLAIMS:

Please amend the claims as follows:

2.   (Amended)   The method of claim 1 wherein said respective local signal-to-noise ratio (SNR$_{post}$) is determined by the following relation:

$$SNR_{post}(f) = POS\left[\frac{E_x^P(f)}{E_n^P(f)} - 1 \right],$$

wherein POS[x] has the value x when x is positive and has the value 0 otherwise, [E$_x$(f)]

5   E$_x^P$(f) is said respective <u>a perceptual</u> total [signal] energy <u>value</u> and [E$_n$(f)] E$_n^P$(f) is [said

respective current estimate of the] <u>a perceptual</u> noise energy <u>value</u>.

10.   (Amended)   The method of claim 9 wherein said at least a respective one of

said plurality of frames is determined to be a stationary frame when a difference in a

logarithm of an energy of said at least one frame and a logarithm in an energy of at a prior

one of said plurality of frames is less than [exceeds] a first predefined threshold value and a

5   linear predictive coding (LPC) prediction error exceeds a second predefined threshold value.

11.   (Amended)   The method of claim 8 wherein said at least one of said

plurality of frames is determined to be a non-speech frame as a function of a sum of weighted

values, each of said weighted values corresponding to a respective one of said frequency

bands of said respective one of said plurality of frames, each of said weighted values being a

5   product of a logarithm of a speech likelihood metric of said corresponding one of said

frequency bands and a weighting factor of said corresponding one of said frequency bands,

and [as a function of] when a linear predictive coding (LPC) prediction error exceeds a

second predefined threshold value.

13.   (Amended)   The method of claim 8 wherein said at least a respective one of

said plurality of frames is determined to be a non-speech frame as a function of a normalized

skewness value of a linear predictive coding (LPC) residual of said at least a respective one of

said plurality of frames and [as a function of] when a linear predictive coding (LPC)

5   prediction error exceeds a second redefined threshold value.

15.   (Amended)   The method of claim 14 wherein said skewness value is

normalized by a function of an estimated value of a total energy E_x of said respective one of

said plurality of frames, said total energy E_x being determined by the following relation:

$E_x = \dfrac{1}{N} \displaystyle\sum_{n=0}^{N-1} [e(n)]^2$, wherein e(n) are sampled values of an LPC residual, and N is a frame

5   length.

       16.   (Amended)   The method of claim 14 wherein said skewness value is

normalized by <u>a function of</u> an estimated value of a variance of said skewness value, said

variance being determined by the following relation:

$$Var[SK] = \dfrac{15 E_n^3}{N},$$ wherein E_n is said current estimate of the noise energy level and N is a

5   frame length.

       18.   (Amended)   The method of claim 17 wherein a value of said update constant

α is determined by one of a watchdog timer being expired, said at least one of said plurality of

frames being stationary, said at least one of said plurality of frames being a non-speech frame,

a LPC residual of said at least one of said plurality of frames having substantially zero

5   skewness, [and] a current value of said estimated noise energy level being greater than a total

energy of said plurality of frames <u>and a linear predictive coding (LPC) predicting error</u>

<u>exceeding a predefined threshold value.</u>

       19.   (Amended)   The method of claim 17 wherein said estimated noise level is

forced to be updated [using a noise energy level of a current frame] when said estimated noise

level is not updated within a preset interval.

25.   (Amended)   The method of claim 24 wherein said at least a respective one of said plurality of frames is determined to be a stationary frame when a difference in a logarithm of an energy of said at least one frame and a logarithm in an energy of at a prior one of said plurality of frames is less than [exceeds] a first predefined threshold value and a

5   linear predictive coding (LPC) prediction error exceeds a second predefined threshold value.

26.   (Amended)   The method of claim 23 wherein said at least a respective one of said plurality of frames is determined to be a non-speech frame as a function of a sum of weighted values, each of said weighted values corresponding to a respective one of said frequency bands of said respective one of said plurality of frames, each of said weighted

5   values being a product of a logarithm of a speech likelihood metric of said corresponding one of said frequency bands and a weighting factor of said corresponding one of said frequency bands, and [as a function of] when a linear predictive coding (LPC) prediction error exceeds a second predefined threshold value.

28.   (Amended)   The method of claim 23 wherein said at least a respective one of said plurality of frames is determined to be a non-speech frame as a function of a normalized skewness value of a linear predictive coding (LPC) residual of said at least a respective one of said plurality of frames and [as a function] when of a linear predictive

5   coding (LPC) prediction error exceeds a second predefined threshold value.

-5-

30.   (Amended)   The method of claim 29 wherein said skewness value is normalized by a function of an estimated value of a total energy $\underline{E}_x$ of said respective one of said plurality of frames, said total energy $\underline{E}_x$ being determined by the following relation:

$$E_x = \frac{1}{N} \sum_{n=0}^{N-1} [e(n)]^2$$, wherein e(n) are sampled values of an LPC residual, and N is a frame

5   length.

31.   (Amended)   The method of claim 29 wherein said skewness value is normalized by <u>a function of</u> an estimated value of a variance of said skewness value, said variance being determined by the following relation:

$$Var[SK] = \frac{15E_n^3}{N}$$, wherein E_n is said current estimate of the noise energy level and N is a

5   frame length.

33.   (Amended)   The method of claim 32 wherein a value of said update constant α is determined by one of a watchdog timer being expired, said at least one of said plurality of frames being stationary, said at least one of said plurality of frames being a non-speech frame, a LPC residual of said at least one of said plurality of frames having substantially zero

5   skewness, [and] a current value of said estimated noise energy level being greater than a total energy of said plurality of frames <u>and a linear predictive coding (LPC) prediction error exceeding a predefined threshold value</u>.

35.   (Amended)   The apparatus of claim 34 wherein said respective local signal-to-noise ratio (SNR$_{post}$) is determined by the following relation:

$$SNR_{post}(f) = POS\left[\frac{E_x^P(f)}{E_n^P(f)} - 1\right],$$

wherein POS[x] has the value x when x is positive and has the value 0 otherwise, [E$_x$(f)]
5   E$_x^P$(f) is [said respective] a perceptual total [signal] energy value and [E$_n$(f)] E$_n^P$(f) is [said respective current estimate of the] a perceptual noise energy value.

43.   (Amended)   The apparatus of claim 42 wherein said at least a respective one of said plurality of frames is determined to be a stationary frame when a difference in a logarithm of an energy of said at least one frame and a logarithm in an energy of at a prior one of said plurality of frames [exceeds] is less than a first predefined threshold value and a
5   linear predictive coding (LPC) prediction error exceeds a second predefined threshold value.

44.   (Amended)   The apparatus of claim 42 wherein said at least one of said plurality of frames is determined to be a non-speech frame as a function of a sum of weighted value, each of said weighted values corresponding to a respective one of said frequency bands of said respective one of said plurality of frames, each of said weighted values being a
5   product of a logarithm of a speech likelihood metric of said corresponding one of said frequency bands and a weighting factor of said corresponding one of said frequency bands, and [as a function of] when a linear predictive coding (LPC) prediction error exceeds a second predefined threshold value.

46.   (Amended)   The apparatus of claim 41 wherein said at least a respective one of said plurality of frames is determined to be a non-speech frame as a function of a normalized skewness value of a linear predictive coding (LPC) residual of said at least a respective one of said plurality of frames and [as a function of] when a linear predictive coding (LPC) prediction error exceeds a second predefined threshold value.

48.   (Amended)   The apparatus of claim 47 wherein said skewness value is normalized by an estimated value of a total energy E_x of said respective one of said plurality of frames, said total energy E_x being determined by the following relation:

$$E_x = \frac{1}{N} \sum_{n=0}^{N-1} [e(n)]^2$$, wherein e(n) are sampled values of an LPC residual, and N is a frame length.

49.   (Amended)   The apparatus of claim 47 wherein said skewness value is normalized by a function of an estimated value of a variance of said skewness value, said variance being determined by the following relation:

$$Var[SK] = \frac{15E_n^3}{N}$$, wherein E_n is said current estimate of the noise energy level and N is a frame length.

51.   (Amended)   The apparatus of claim 50 wherein a value of said update

constant α is determined by one of a watchdog timer being expired, said at least one of said

plurality of frames being stationary, said at least one of said plurality of frames being a non-

speech frame, a LPC residual of said at least one of said plurality of frames having

5   substantially zero skewness, [and] a current value of said estimated noise energy level being

greater than a total energy of said plurality of frames and a linear predictive coding (LPC)

prediction error exceeding a predefined threshold value.

52.   (Amended)   The apparatus of claim 41 wherein said estimated noise level is

forced to be updated [using a noise energy level of a current frame] when said estimated noise

level is not updated within a preset interval.

58.   (Amended)   The apparatus of claim 57 wherein said at least a respective one

of said plurality of frames is determined to be a stationary frame when a difference in a

logarithm of an energy of said at least one frame and a logarithm in an energy of at a prior

one of said plurality of frames [exceeds] is less than a first predefined threshold value and a

5   linear predictive coding (LPC) prediction error exceeds a second predefined threshold value.

59.   (Amended)   The apparatus of claim 56 wherein said at least a respective one

of said plurality of frames is determined to be a non-speech frame as a function of a sum of

weighted values, each of said weighted values corresponding to a respective one of said

frequency bands of said respective one of said plurality of frames, each of said weighted

5   values being a product of a logarithm of a speech likelihood metric of said corresponding one

of said frequency bands and a weighting factor of said corresponding one of said frequency

bands, and <u>when</u> [as a function of] a linear predictive coding (LPC) prediction error <u>exceeds a</u>

<u>second predefined threshold value</u>.

61.   (Amended)   The apparatus of claim 56 wherein said at least a respective one

of said plurality of frames is determined to be a non-speech frame as a function of a

normalized skewness value of a linear predictive coding (LPC) residual of said at least a

respective one of said plurality of frames and [as a function of] <u>when</u> a linear predictive

5   coding (LPC) prediction error <u>exceeds a second predefined threshold value</u>.

63.   (Amended)   The apparatus of claim 61 wherein said skewness value is

normalized by an estimated value of a total energy $\underline{E}_x$ of said respective one of said plurality

of frames, said total energy $\underline{E}_x$ being determined by the following relation:

$$E_x = \frac{1}{N} \sum_{n=0}^{N-1} [e(n)]^2$$, wherein e(n) are sampled values of an LPC residual, and N is a frame

5   length.

64.   (Amended)   The apparatus of claim 62 wherein said skewness value is

normalized by <u>a function of</u> an estimated value of a variance of said skewness value, said

variance being determined by the following relation:

$$Var[SK] = \frac{15E_n^3}{N}$$, wherein E_n is said current estimate of the noise energy level and N is a

5   frame length.

66.   (Amended)   The apparatus of claim 65 wherein a value of said update

constant α is determined by one of a watchdog timer being expired, said at least one of said

plurality of frames being stationary, said at least one of said plurality of frames being a non-

speech frame, a LPC residual of said at least one of said plurality of frames having

5   substantially zero skewness, [and] a current value of said estimated noise energy level being

greater than a total energy of said plurality of frames and a linear predictive coding (LPC)

prediction error exceeding a predefined threshold value.

Add the following new claims:

--67.   The method of claim 10 wherein said LPC prediction error (PE) is determined

by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2]$$, wherein rc_k is a reflection coefficient generated by LPC analysis.

68.   The method of claim 11 wherein said LPC prediction error (PE) is determined

by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2]$$, wherein rc_k is a reflection coefficient generated by LPC analysis.

69.   The method of claim 13 wherein said LPC prediction error (PE) is determined

by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] \text{ , wherein } rc_k \text{ is a reflection coefficient generated by LPC analysis.}$$

70.   The method of claim 18 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] \text{ , wherein } rc_k \text{ is a reflection coefficient generated by LPC analysis.}$$

71.   The method of claim 25 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] \text{ , wherein } rc_k \text{ is a reflection coefficient generated by LPC analysis.}$$

72.   The method of claim 26 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] \text{ , wherein } rc_k \text{ is a reflection coefficient generated by LPC analysis.}$$

73.   The method of claim 28 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] \text{ , wherein } rc_k \text{ is a reflection coefficient generated by LPC analysis.}$$

74.   The method of claim 33 wherein said LPC prediction error (PE) is determined

by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] ,$$ wherein rc_k is a reflection coefficient generated by LPC analysis.

75. The of claim 43 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] ,$$ wherein rc_k is a reflection coefficient generated by LPC analysis.

76. The of claim 44 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] ,$$ wherein rc_k is a reflection coefficient generated by LPC analysis.

77. The of claim 46 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] ,$$ wherein rc_k is a reflection coefficient generated by LPC analysis.

78. The of claim 51 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] ,$$ wherein rc_k is a reflection coefficient generated by LPC analysis.

79.   The of claim 58 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] ,$$ wherein rc_k is a reflection coefficient generated by LPC analysis.

80.   The of claim 59 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] ,$$ wherein rc_k is a reflection coefficient generated by LPC analysis.

81.   The of claim 61 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] ,$$ wherein rc_k is a reflection coefficient generated by LPC analysis.

82.   The of claim 66 wherein said LPC prediction error (PE) is determined by the following relation:

$$PE = \prod_{k=0}^{K-1} [1 - rc_k{}^2] ,$$ wherein rc_k is a reflection coefficient generated by LPC analysis.

83.   The method of claim 15 wherein said normalized skewness value γ_3 is determined by the following relation:

$$\gamma_3 = \frac{SK}{E_x^{1.5}} .$$

84. The method of claim 16 wherein said normalized skewness value $\gamma_3{}'$ is determined by the following relation:

$$\gamma_3{}' = \frac{SK}{\sqrt{\frac{15E_n^3}{N}}}.$$

85. The method of claim 30 wherein said normalized skewness value γ_3 is determined by the following relation:

$$\gamma_3 = \frac{SK}{E_x^{1.5}}.$$

86. The method of claim 31 wherein said normalized skewness value $\gamma_3{}'$ is determined by the following relation:

$$\gamma_3{}' = \frac{SK}{\sqrt{\frac{15E_n^3}{N}}}.$$

87. The of claim 48 wherein said normalized skewness value γ_3 is determined by the following relation:

$$\gamma_3 = \frac{SK}{E_x^{1.5}}.$$

88. The of claim 49 wherein said normalized skewness value $\gamma_3{}'$ is determined by the following relation:

$$\gamma_3' = \frac{SK}{\sqrt{\frac{15E_n^3}{N}}} \cdot$$

89.   The of claim 63 wherein said normalized skewness value γ_3 is determined by the following relation:

$$\gamma_3 = \frac{SK}{E_x^{1.5}} \cdot$$

90.   The of claim 64 wherein said normalized skewness value γ_3' is determined by the following relation:

$$\gamma_3' = \frac{SK}{\sqrt{\frac{15E_n^3}{N}}} \cdot$$

91.   The method of claim 17 wherein said update constant α has a value of 0.002 when a watchdog timer is expired and a linear predictive coding (LPC) prediction error (PE) exceeds a predefined LPC prediction error threshold value T_{PE1}; said update constant α has a value of 0.05 when said at least one of said plurality of frames is stationary; said update constant α has a value of 0.1 when a noise likelihood value is less than a noise likelihood threshold value T_{LIK} and said LPC prediction error PE is greater than a predefined LPC prediction error threshold value T_{PE2} such that said at least one of said plurality of frames is a non-speech frame; said update constant α has a value of 0.05 when an absolute value of a

normalized skewness of a LPC residual is less than a first threshold value T_a, said skewness

10   of said LPC residual being normalized by total energy, or is less than a second threshold

value T_b, said skewness of said LPC residual being normalized by a variance of said skewness

of said LPC residual, and when said LPC prediction error PE is greater than a predefined LPC

prediction error threshold value T_{PE2} so that a LPC residual of said at least one of said

plurality of frames has substantially zero skewness; and said update constant α has a value of

15   0.1 when a current value of said estimated noise energy level is greater than a total energy of

said plurality of frames.

92.   The method of claim 32 wherein said update constant α has a value of 0.002

when a watchdog timer is expired and a linear predictive coding (LPC) prediction error (PE)

exceeds a predefined LPC prediction error threshold value T_{PE1}; said update constant α has a

value of 0.05 when said at least one of said plurality of frames is stationary; said update

5   constant α has a value of 0.1 when a noise likelihood value is less than a noise likelihood

threshold value T_{LIK} and said LPC prediction error PE is greater than a predefined LPC

prediction error threshold value T_{PE2} such that said at least one of said plurality of frames is a

non-speech frame; said update constant α has a value of 0.05 when an absolute value of a

normalized skewness of a LPC residual is less than a first threshold value T_a, said skewness

10   of said LPC residual being normalized by total energy, or is less than a second threshold

value T_b, said skewness of said LPC residual being normalized by a variance of said skewness

of said LPC residual, and when said LPC prediction error PE is greater than a predefined LPC

prediction error threshold value T_{PE2} so that a LPC residual of said at least one of said

plurality of frames has substantially zero skewness; and said update constant α has a value of

15   0.1 when a current value of said estimated noise energy level is greater than a total energy of

said plurality of frames.

        93.   The of claim 50 wherein said update constant α has a value of 0.002 when a

watchdog timer is expired and a linear predictive coding (LPC) prediction error (PE) exceeds

a predefined LPC prediction error threshold value T_{PE1}; said update constant α has a value of

0.05 when said at least one of said plurality of frames is stationary; said update constant α has

5   a value of 0.1 when a noise likelihood value is less than a noise likelihood threshold value

T_{LIK} and said LPC prediction error PE is greater than a predefined LPC prediction error

threshold value T_{PE2} such that said at least one of said plurality of frames is a non-speech

frame; said update constant α has a value of 0.05 when an absolute value of a normalized

skewness of a LPC residual is less than a first threshold value T_a, said skewness of said LPC

10   residual being normalized by total energy, or is less than a second threshold value T_b, said

skewness of said LPC residual being normalized by a variance of said skewness of said LPC

residual, and when said LPC prediction error PE is greater than a predefined LPC prediction

error threshold value T_{PE2} so that a LPC residual of said at least one of said plurality of frames

has substantially zero skewness; and said update constant α has a value of 0.1 when a current

15   value of said estimated noise energy level is greater than a total energy of said plurality of

frames.

        94.   The of claim 65 wherein said update constant α has a value of 0.002 when a

watchdog timer is expired and a linear predictive coding (LPC) prediction error (PE) exceeds

a predefined LPC prediction error threshold value T_{PE1}; said update constant α has a value of

0.05 when said at least one of said plurality of frames is stationary; said update constant α has

5   a value of 0.1 when a noise likelihood value is less than a noise likelihood threshold value

T_{LIK} and said LPC prediction error PE is greater than a predefined LPC prediction error

threshold value T_{PE2} such that said at least one of said plurality of frames is a non-speech

frame; said update constant α has a value of 0.05 when an absolute value of a normalized

skewness of a LPC residual is less than a first threshold value T_a, said skewness of said LPC

10   residual being normalized by total energy, or is less than a second threshold value T_b, said

skewness of said LPC residual being normalized by a variance of said skewness of said LPC

residual, and when said LPC prediction error PE is greater than a predefined LPC prediction

error threshold value T_{PE2} so that a LPC residual of said at least one of said plurality of frames

has substantially zero skewness; and said update constant α has a value of 0.1 when a current

15   value of said estimated noise energy level is greater than a total energy of said plurality of

frames.

95.   The method of claim 2 wherein said perceptual total energy value $E^P_x(f)$ is

determined by the following relation:

$$E^p_x(f) = W(f) \otimes E_x(f)$$, and said perceptual noise energy $E^P_n(f)$ is determined by the

following relation:

5      $$E^p_n(f) = W(f) \otimes E_n(f)$$, wherein $E_x(f)$ is said respective total signal energy and $E_n(f)$ is

said respective current estimate of the noise energy, $\otimes$ denotes convolution and W(f) is an

auditory filter centered at f.

96.   The apparatus of claim 35 wherein said perceptual total energy value $E^p_x(f)$ is determined by the following relation:

$$E^p_x(f) = W(f) \otimes E_x(f)$$, and said perceptual noise energy $E^p_n(f)$ is determined by the

following relation:

5    $$E^p_n(f) = W(f) \otimes E_n(f)$$, wherein $E_x(f)$ is said respective total signal energy and $E_n(f)$ is

said respective current estimate of the noise energy, $\otimes$ denotes convolution and $W(f)$ is an

auditory filter centered at f.

97.   A method of reducing noise in a transmitted signal comprised of a plurality of

frames, each of said frames including a plurality of frequency bands; said method comprising

the steps of :

determining whether said plurality of frequency bands of at least a respective one of

5   said plurality of frames are strong speech bands; and

setting, when a count of said strong speech bands is less than a predetermined fraction

of a total number of said plurality of frequency bands, a filter gain of at least said strong

speech bands to a minium value.

99.   The method of claim 98 wherein said determining step includes determining

whether said plurality of frequency bands of said respective one of said plurality of frames

each has a likelihood metric whose value is greater than a predetermined threshold value.

100.   The method of claim 99 wherein said speech likelihood metric of a respective

-20-

one of said plurality of frequency bands is determined by the following relation:

$$\Lambda(f) = \frac{e^{\left[\left(\frac{SNR_{prior}(f)}{1+SNR_{prior}(f)}\right)SNR_{post}(f)\right]}}{1+SNR_{prior}(f)}$$, wherein SNR_{post} is a respective local signal-to-

noise ratio and SNR_{prior} is a respective smoothed signal-to-noise ratio.

101.   The method of claim 100 wherein said respective local signal-to-noise ratio

(SNR_{post}) is determined by the following relation:

$$SNR_{post}(f) = POS\left[\frac{E_x^P(f)}{E_n^P(f)} - 1\right]$$, wherein POS[x] has the value x when x is positive and

has the value 0 otherwise, $E_x^P(f)$ is a perceptual total energy and $E_n^P(f)$ is a perceptual noise

5   energy.

102.   The method of claim 101 wherein said perceptual total energy value $E_x^P(f)$ is

determined by the following relation:

$$E_x^P(f) = W(f) \otimes E_x(f)$$, and said perceptual noise energy $E_n^P(f)$ is determined by the

following relation:

5    $$E_n^P(f) = W(f) \otimes E_n(f)$$, wherein $E_x(f)$ is a respective total signal energy and $E_n(f)$ is a

-21-

respective current estimate of the noise energy, ⊗ denotes convolution and W(f) is an auditory filter centered at f.

103.   The method of claim 100 wherein said respective smoothed signal-to-noise ratio (SNR$_{prior}$) is determined by the following relation:

$$SNR_{prior}(f) = (1 - \gamma)SNR_{post}(f) + \gamma SNR_{est}(f),$$

wherein γ is a smoothing constant, SNR$_{post}$ is said respective local signal-to-noise ratio and

5   SNR$_{est}$ is said estimated respective signal-to-noise ratio.

104.   The method of claim 103 wherein said estimated respective signal-to-noise ratio (SNR$_{est}$) is determined by the following relation:

$$SNR_{est}(f) = |G(f)|^2 \cdot SNR_{post}(f)$$, wherein G(f) is a prior respective signal gain and

SNR$_{post}$ is said respective local signal-to-noise ratio.

105.   An apparatus of reducing noise in a transmitted signal comprised of a plurality of frames, each of said frames including a plurality of frequency bands; said apparatus comprising:

means for determining whether said plurality of frequency bands of at least a

5   respective one of said plurality of frames are strong speech bands; and

means for setting, when a count of said strong speech bands is less than a predetermined fraction of a total number of said plurality of frequency bands, a filter gain of at least said strong speech bands to a minium value.

-22-

106. The apparatus of claim 105 wherein said means for determining includes means for determining whether said plurality of frequency bands of said respective one of said plurality of frames each has a likelihood metric whose value is greater than a predetermined threshold value.

107. The apparatus of claim 106 wherein said speech likelihood metric of a respective one of said plurality of frequency bands is determined by the following relation:

$$\Lambda(f) = \frac{e^{\left[\left(\frac{SNR_{prior}(f)}{1+SNR_{prior}(f)}\right)SNR_{post}(f)\right]}}{1+SNR_{prior}(f)}$$, wherein SNR_{post} is a respective local signal-to-

noise ratio and SNR_{prior} is a respective smoothed signal-to-noise ratio.

108. The apparatus of claim 107 wherein said respective local signal-to-noise ratio (SNR_{post}) is determined by the following relation:

$$SNR_{post}(f) = POS\left[\frac{E_x^p(f)}{E_n^p(f)} - 1\right]$$, wherein POS[x] has the value x when x is positive and

has the value 0 otherwise, $E_x^p(f)$ is a perceptual total energy and $E_n^p(f)$ is a perceptual noise energy.

109.   The apparatus of claim 108 wherein said perceptual total energy value $E^p_x(f)$ is determined by the following relation:

$$E^p_x(f) = W(f) \otimes E_x(f)$$, and said perceptual noise energy $E^p_n(f)$ is determined by the

following relation:

5    $$E^p_n(f) = W(f) \otimes E_n(f)$$, wherein $E_x(f)$ is a respective total signal energy and $E_n(f)$ is a

respective current estimate of the noise energy, $\otimes$ denotes convolution and $W(f)$ is an auditory

filter centered at f.

110.   The apparatus of claim 107 wherein said respective smoothed signal-to-noise

ratio (SNR_{prior}) is determined by the following relation:

$$SNR_{prior}(f) = (1 - \gamma)SNR_{post}(f) + \gamma SNR_{est}(f),$$

wherein γ is a smoothing constant, SNR_{post} is said respective local signal-to-noise ratio and

5   SNR_{est} is said estimated respective signal-to-noise ratio.

111.   The apparatus of claim 110 wherein said estimated respective signal-to-noise

ratio (SNR_{est}) is determined by the following relation:

$$SNR_{est}(f) = |G(f)|^2 \cdot SNR_{post}(f)$$, wherein $G(f)$ is a prior respective signal gain and

SNR_{post} is said respective local signal-to-noise ratio.--

IN THE ABSTRACT OF THE DISCLOSURE

Please amend the Abstract as follows:

-24-